

2017 Solar Siting Analysis Update



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Introduction

In October 2012, shortly after the Solar Act was signed into legislation, the NJDEP's Bureau of Energy and Sustainability—then under the name Sustainability and Green Energy (SAGE)—developed the Solar Siting Analysis. The SSA document and supporting mapping application was developed to aid the Department, local communities, and potential developers in planning for solar installations by distinguishing between sites where the Department encourages solar development from those where the Department discourages solar development. As a clean energy source, solar has many environmental benefits associated with it that can unfortunately be lost if solar projects are not properly sited. The SSA document and supplemental mapping product is intended to be used as a guidance tool to evaluate proposed projects based on the land use type in the proposed location, and should not be used to automatically disqualify projects from consideration.

In March 2017, the Bureau of Energy and Sustainability set out to update the 2012 Solar Siting Analysis to reflect the changes that have taken place in the state, as well as changes in solar energy technology and markets during this time.

Data and Methodology

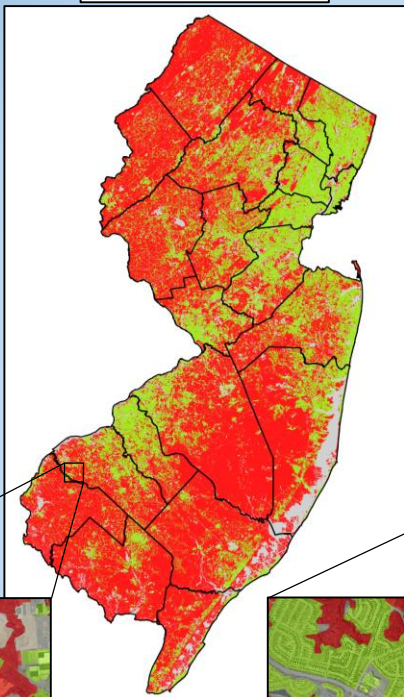
This analysis utilizes Anderson Codes for Land Use/Land Cover in order to determine which areas the Department would encourage and discourage solar installations. The 2012 Solar Siting Analysis utilized the Land Use/Land Cover data from 2007 to determine these areas. This update (2017) utilizes the most current Land Use/Land Cover data available for the State of New Jersey, which was completed in late 2012.

Each Anderson Code in the LU/LC data layer was assigned a category based on the Department's goals and preference for installing solar:

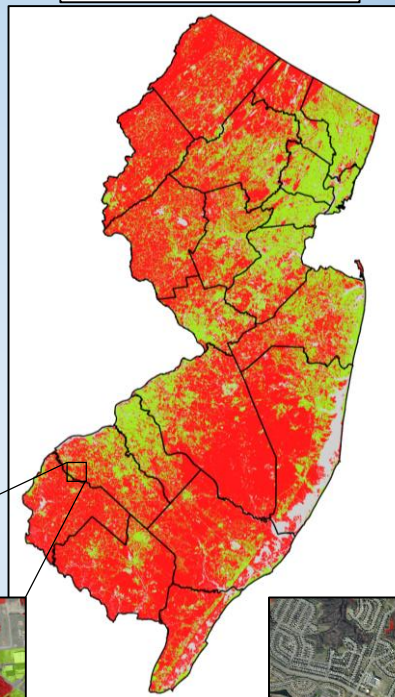
- **Preferred Areas**—characterized primarily as developed urban lands or barren land;
- **Non-Preferred Areas**—natural lands, dominated by forests, wetlands, agriculture, and open space that the Department sets out to protect and preserve;
- **Gray Areas**—water bodies and other land use types that do not fit into the other categories.

Once each Anderson Code was assigned a category for preference, they were integrated into the 2012 LU/LC GIS data layer, which was then clipped to the coastline. The acreage for each resulting polygon was calculated in ArcMap, prior to exporting the attribute table into Microsoft Excel for further analysis. In addition, a spatial overlay was conducted to compare the 2012 SSA GIS layer and the 2017 SSA Update GIS layer in order to identify areas where the siting preference category had changed so that additional analyses of the land use changes could be conducted (seen in the images above and in the top right).

2012 Solar Siting Analysis



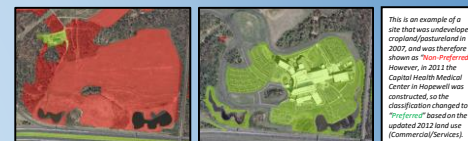
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Results

Between 2007 and 2012 (the dates of the LU/LC used for the 2012 SSA and the 2017 SSA Update respectively), there were minor changes to the overall land use in the state (see table below). The amount of "preferred area" for installing solar increased by almost 27,000 acres—mainly due to development and the conversion of forests and/or agricultural lands to urban lands. This same trend can be seen through the loss of roughly 16,000 "non-preferred" acres and roughly 10,000 "gray" acres. Despite this change, the overall percentage of each of these categories did not change from the 2012 analysis to the 2017 update.

Area Type	2012 SSA Acreage	2017 SSA Acreage	Acreage Change	2012 % Total	2017 % Total	% Total Change
Preferred	3,328,684.39	3,355,375.11	26,690.72	27%	27%	0%
Non-Preferred	3,025,383.79	3,009,785.28	(15,598.51)	63%	63%	0%
Gray	634,801.45	604,917.01	(29,884.44)	12%	12%	0%
TOTAL	6,988,869.63	6,970,077.36	(18,792.27)	100%	100%	0%



Discussion and Conclusion

When considering siting solar PV projects, existing impervious surfaces, such as residential and commercial rooftops and paved roadways and parking lots (for elevated solar carport systems), are most desirable since siting solar projects in these locations does not introduce any additional direct land disturbance that might affect ecosystem services. Siting solar in these locations is also in line with the Department's mission to preserve natural lands and open space.

Based on the 2017 SSA Update, roughly 27% of the State of New Jersey can be classified as "preferred" for installing solar, largely a result of urbanized development. While this tool can be used to identify where the "preferred areas" are in the State, there are many other considerations that should be taken into account when evaluating a proposed solar PV installation, including (but not limited to):

- Location and proximity to flood hazard areas;
- Location and proximity to threatened and endangered species;
- Location and proximity to environmental hazards (i.e. landfills, brownfields, and other contaminated sites)

Future land use changes and changes in solar technology will also have to be taken into account in future updates to this analysis. For example, the land use classification for Artificial Lakes (5300) is currently "gray" for the sake of this analysis. However, a new trend in solar technology is "floating solar"—or siting solar installations on floating pontoons on reservoirs and lakes. As these installations become more popular and economically feasible, the classification of Artificial Lakes may have to be adjusted to "preferred areas". Similar changes will also have to be considered as they are discovered and become more prevalent throughout the country and State.

Applying the Solar Siting Analysis

The Solar Siting Analysis can be used to evaluate a site, prior to solar PV installation, in order to identify which sections of the property would be best for siting the solar project. In the hypothetical example below, the SSA was applied to the "proposed site" and indicates which areas would be most preferred for solar—roughly 28% of the property, characterized by industrial rooftop and impervious parking lot locations. The remainder of the property is deemed to be non-preferred (34%) or gray (38%), characterized by mixed forest and wetlands, in addition to artificial lakes and other urban lands.

LAND ID	LAND USE	ANALYSIS	ACREAGE	Solar Siting Category
1001	RESIDENTIAL	ANALYSIS	1.2543	Preferred Area
1002	RESIDENTIAL	ANALYSIS	1.2543	Preferred Area
1003	RESIDENTIAL	ANALYSIS	1.2543	Preferred Area
1004	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1005	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1006	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1007	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1008	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1009	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1010	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1011	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1012	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1013	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1014	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1015	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1016	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1017	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1018	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1019	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1020	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1021	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1022	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1023	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1024	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1025	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1026	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1027	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
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1098	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1099	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area
1100	STORMWATER BASIN	ANALYSIS	2.0087	Preferred Area

